DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
ARIZONA DEPARTMENT OF WATER RESOURCES

WATER-RESOURCES INVESTIGATIONS
OPEN-FILE REPORT 82-87
SHEET 2 OF 2
SPECIFIC CONDUCTANCE AND FLUORIDE CONCENTRATION

The specific conductance of water (values shown on the map) reflects the concentration of ions in solution and is an indication of the dissolved-solids concentration in the water. The dissolved-solids values may be estimated by multiplying the specific conductance by 0.6. The recommended maximum concentration for dissolved solids in public water supplies is 500 mg/L (milligrams per liter), as proposed in the secondary drinking-water regulations of the U.S. Environmental Protection Agency (1977b, p. 17146). The U.S. Environmental Protection Agency (1977a, b) has established national regulations and guidelines for the quality of water provided by public water systems. The regulations are either primary or secondary. Primary drinking-water regulations govern constituents in drinking water that have been shown to affect human health. Secondary drinking-water regulations apply to constituents that affect esthetic quality. The primary regulations are enforceable either by the Environmental Protection Agency or by the States; in contrast, the secondary regulations are not federally enforceable. The secondary regulations are intended as guidelines for the States. The regulations express limits as "maximum contaminant levels," where contaminant means any physical, chemical, biological, or radiological substance or matter in water. In the Bill Williams area ground water contains about 75 to 3,000 mg/L of dissolved solids, and most water contains less than 500 mg/L. Where the dissolved-solids concentrations exceed 500 mg/L, the use of the ground water for irrigation may have detrimental effects on sensitive crops (U.S. Environmental Protection Agency, 1976, p. 208).

In the Bill Williams area ground water generally is of the calcium bicarbonate, sodium bicarbonate, or mixed bicarbonate type. In general, the chemical quality of the perennial flow in the Big Sandy River and in Burro and Kirkland Creeks is similar to that of the ground water. At streamflow-sampling sites 09424436 and 09424440 on Boulder Creek near Bagdad, however, the water is of a mixed sulfate type, and the ground water in the unused flowing well in sec. 26, T. 15 N., R. 10 W., is of a sodium bicarbonate type. The water from the well also contained 0.095 mg/L or 95 µg/L (micrograms per liter) of arsenic, which exceeds the recommended maximum concentration of 0.05 mg/L or 50 µg/L (Bureau of Water Quality Control, 1978, p. 5). Water samples from other wells near Bagdad, however, did not show excessive concentrations of arsenic.

The recommended maximum concentration for fluoride in public water supplies differs according to the annual average maximum daily air temperature (Bureau of Water Quality Control, 1978, p. 6). In the Central highlands province the annual average maximum daily air temperature is 76°F, and the maximum concentration for fluoride is 1.6 mg/L. The fluoride concentrations ranged from 0.2 to 18 mg/L; about one-third of the water samples analyzed contained 1.6 mg/L or more of fluoride. In the Basin and Range lowlands province the annual average maximum daily air temperature is 87°F, and the maximum concentration for fluoride is 1.4 mg/L. The fluoride concentrations ranged from 0.3 to 22 mg/L; slightly more than one-half of the water samples analyzed contained 1.4 mg/L or more of fluoride.

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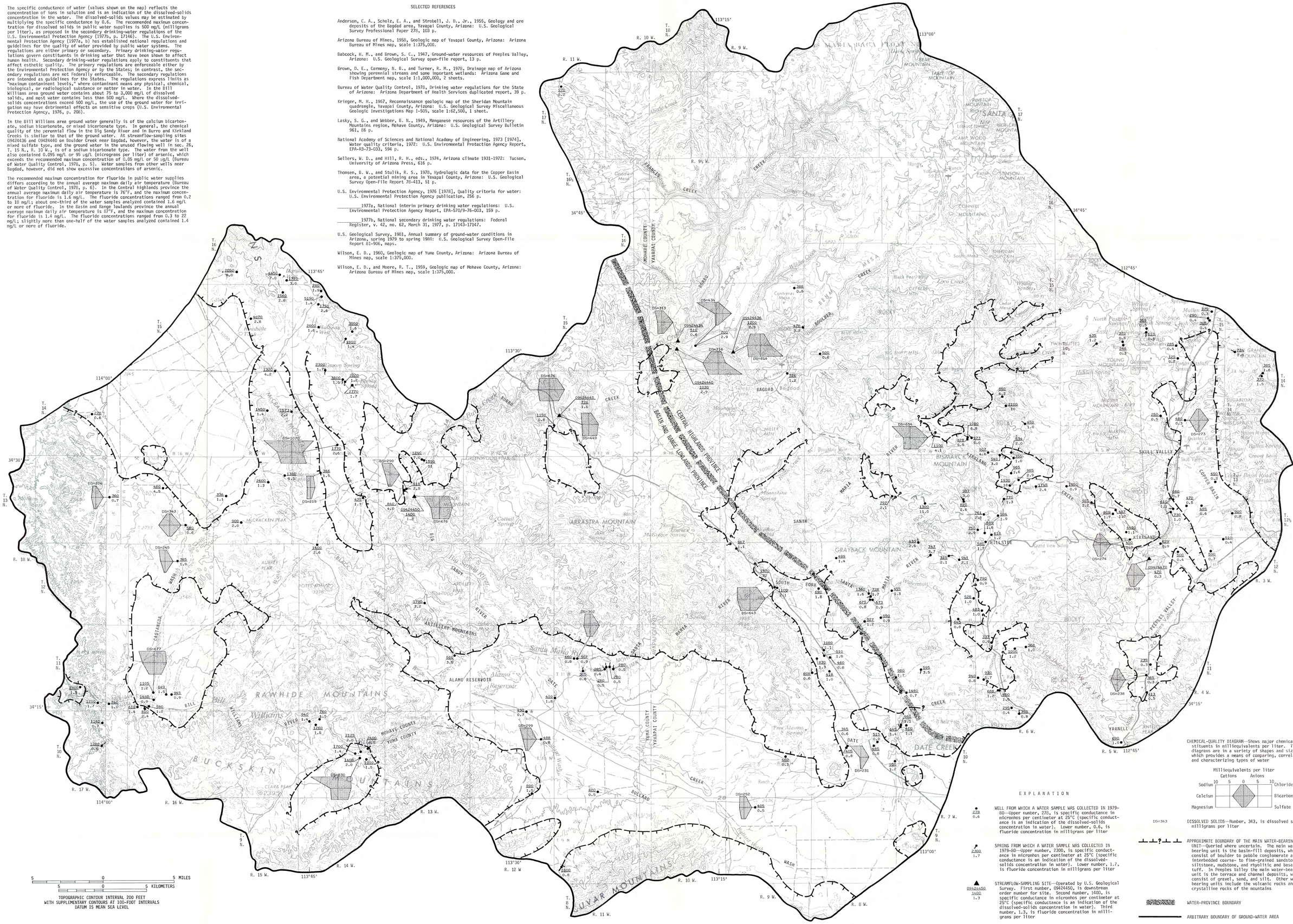
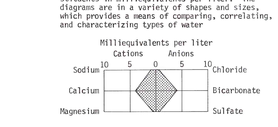



CHEMICAL-QUALITY DIAGRAM—Shows major chemical constituents in milliequivalents per liter. The diagrams are in a variety of shapes and sizes, which provides a means of comparing, correlating, and characterizing types of water




EXPLANATION

278 / 0.6 — WELL FROM WHICH A WATER SAMPLE WAS COLLECTED IN 1979-80—Upper number, 278, is specific conductance in micromhos per centimeter at 25°C (specific conductance is an indication of the dissolved-solids concentration in water). Lower number, 0.6, is fluoride concentration in milligrams per liter

2300 / 1.7 — SPRING FROM WHICH A WATER SAMPLE WAS COLLECTED IN 1979-80—Upper number, 2300, is specific conductance in micromhos per centimeter at 25°C (specific conductance is an indication of the dissolved-solids concentration in water). Lower number, 1.7, is fluoride concentration in milligrams per liter

09424450 / 1400 / 1.3 — STREAMFLOW-SAMPLING SITE—Operated by U.S. Geological Survey. First number, 09424450, is downstream order number for site. Second number, 1400, is specific conductance in micromhos per centimeter at 25°C (specific conductance is an indication of the dissolved-solids concentration in water). Third number, 1.3, is fluoride concentration in milligrams per liter

DS=343 — DISSOLVED SOLIDS—Number, 343, is dissolved solids in milligrams per liter

APPROXIMATE BOUNDARY OF THE MAIN WATER-BEARING UNIT—Queried where uncertain. The main water-bearing unit is the basin-fill deposits, which consist of boulder to pebble conglomerate and interbedded coarse- to fine-grained sandstone, siltstone, mudstone, and rhyolitic and basaltic tuff. In Peeples Valley the main water-bearing unit is the terrace and channel deposits, which consist of gravel, sand, and silt. Other water-bearing units include the volcanic rocks and the crystalline rocks of the mountains

WATER-PROVINCE BOUNDARY

ARBITRARY BOUNDARY OF GROUND-WATER AREA

BASE FROM U.S. GEOLOGICAL SURVEY
NEEDLES 1:250,000, 1956 AND
PRESCOTT 1:250,000, 1954

SPECIFIC CONDUCTANCE AND FLUORIDE CONCENTRATION

# MAPS SHOWING GROUND-WATER CONDITIONS IN THE BILL WILLIAMS AREA, MOHAVE, YAVAPAI, AND YUMA COUNTIES, ARIZONA—1980

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